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Determination of isoflavones in soy and selected foods containing soy by extraction, saponification, and liquid chromatography: collaborative study.

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Isoflavones are biologically active compounds occurring naturally in a variety of plants, with relatively high levels found in soybeans. Twelve laboratories participated in a collaborative study to determine the aglycon isoflavone content of 8 test samples of soy and foods containing soy. The analytical method for the determination of isoflavones incorporates a mild saponification step that reduces the number of analytes measured and permits quantitation versus commercially available, stable reference standards. Test samples were extracted at 65 degrees C with methanol-water (80 + 20), saponified with dilute sodium hydroxide solution, and analyzed by reversed-phase liquid chromatography with UV detection at 260 nm. Isoflavone results were reported as microg/aglycon/g or microg aglycon equivalents/g. The 8 test samples included 2 blind duplicates and 4 single test samples with total isoflavone concentrations ranging from approximately 50 to 3000 microg/g. Test samples of soy ingredients and products made with soy were distributed to collaborators with appropriate reference standards. Collaborators were asked to analyze test samples in duplicate on 2 separate days. The data were analyzed for individual isoflavone components, subtotals of daidzin-daidzein, glycitin-glycitein, and genistin-genistein, and total isoflavones. The relative standard deviation (RSD) for repeatability was 1.8-7.1%, and the RSD for reproducibility was 3.2-16.1% for total isoflavone values of 47-3099 microg/g.